科学的隐忧

THE SECRET LIFE OF SCIENCE

How It Really Works and Why It Matters

科学是如何工作与共享的

[英] 杰里米·鲍伯戈（Jeremy J. Baumberg）著　汪婕舒 译

中信出版集团

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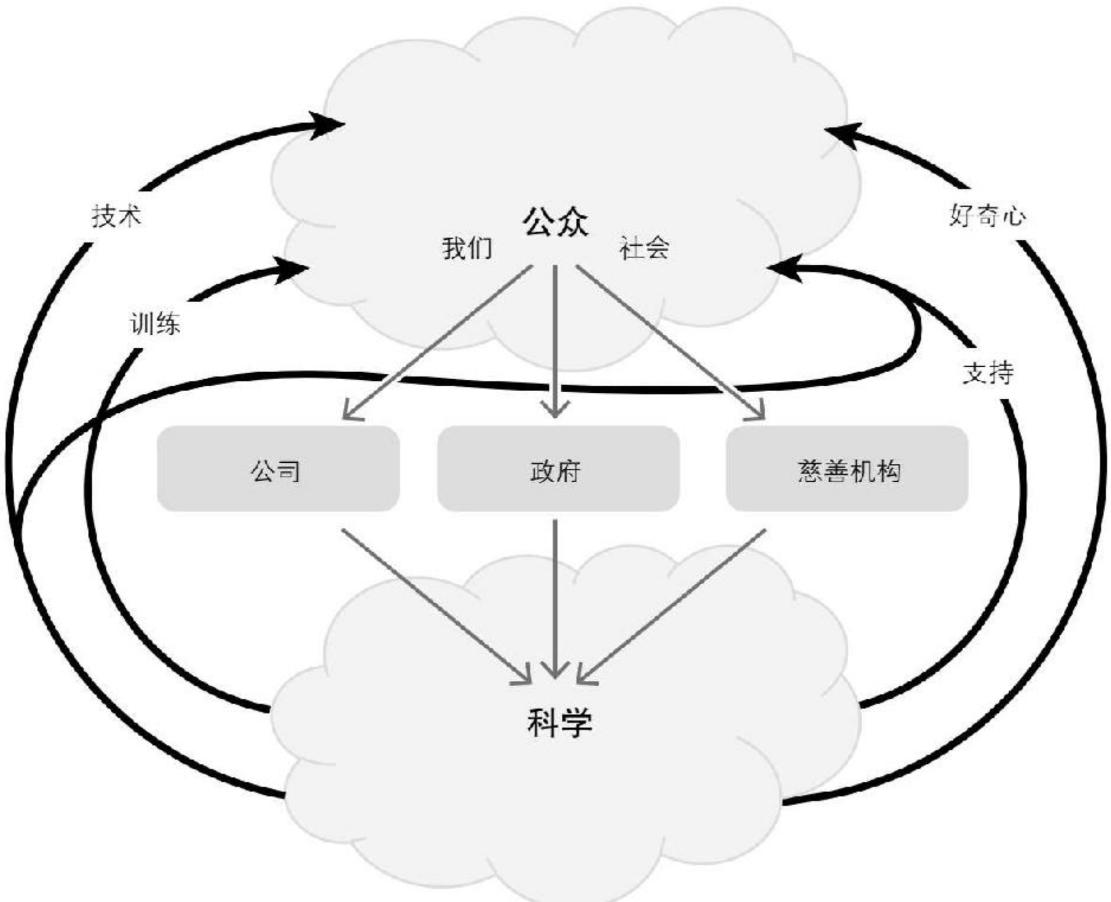
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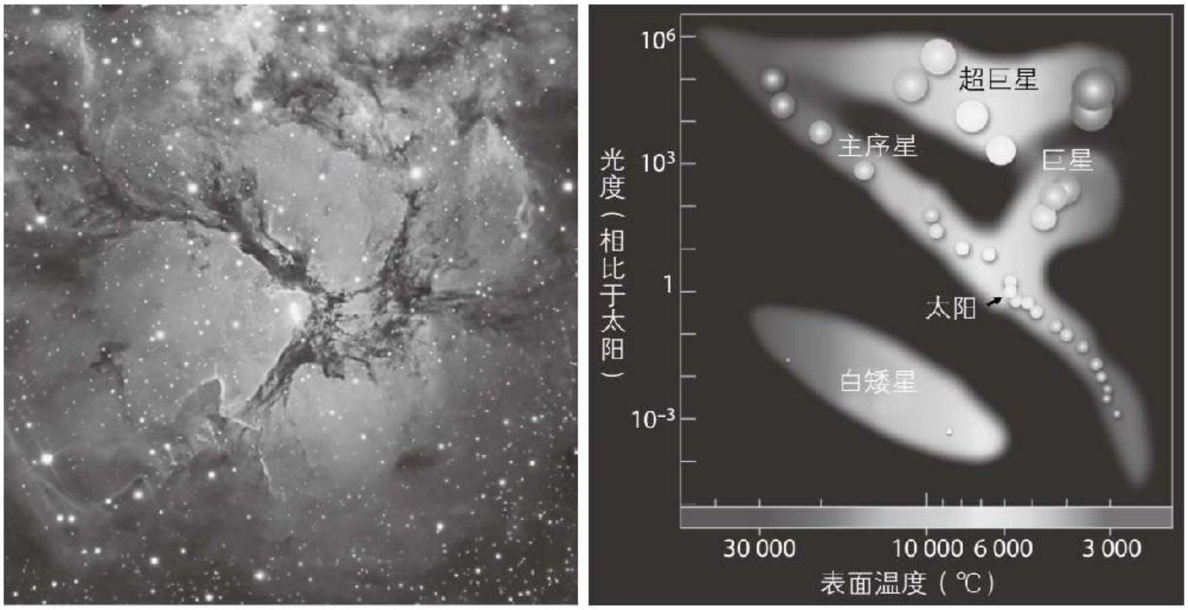


图 2–1（a）　　图 2–1（b）

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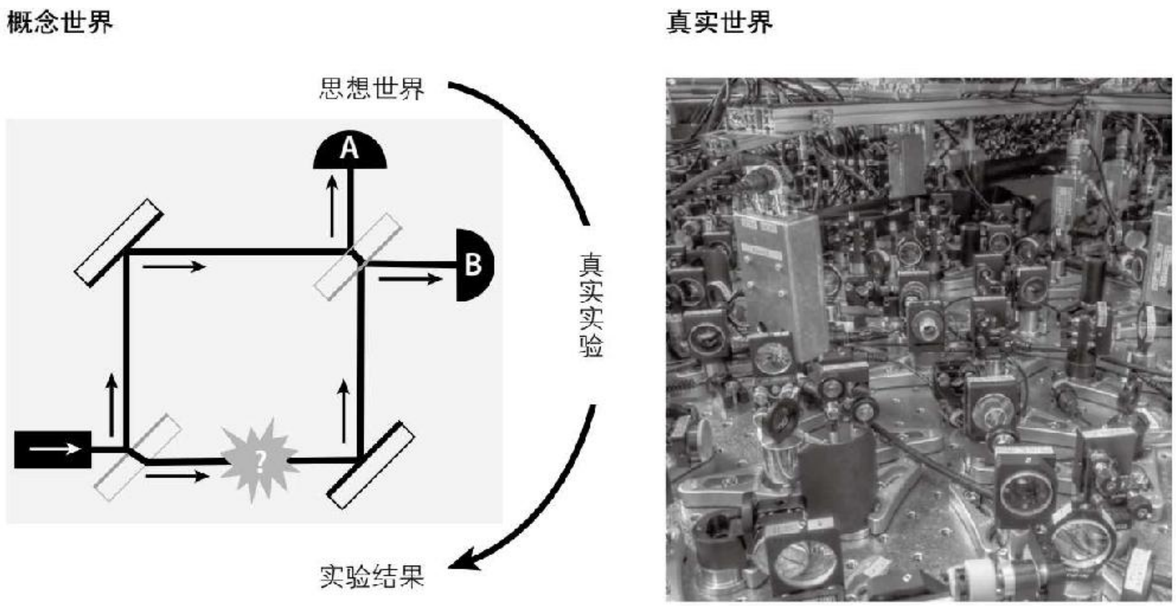
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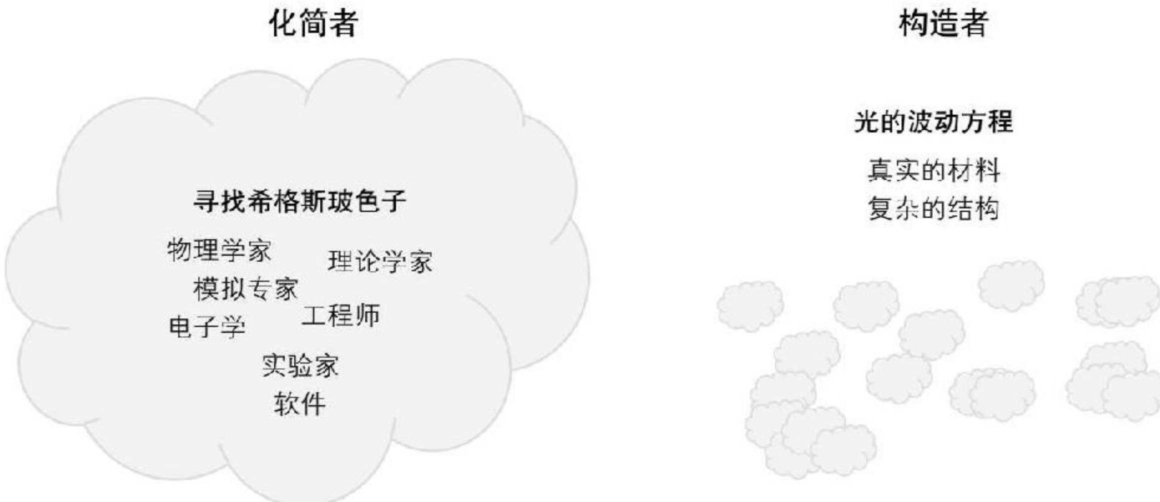


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化简者
构造者
寻找希格斯玻色子
物理学家
理论学家
模拟专家
工程师
电子学
实验家
软件
光的波动方程
真实的材料
复杂的结构

2-4

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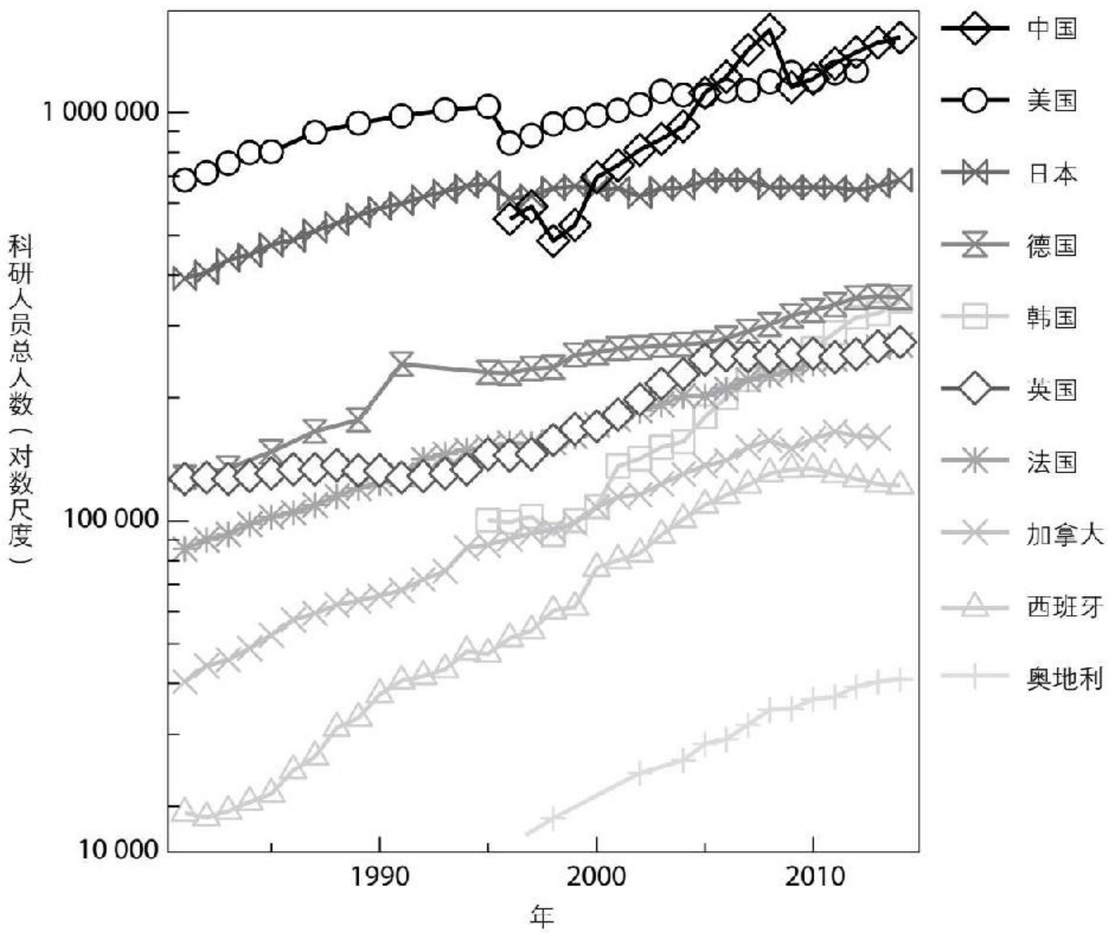
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10 000
1990
2000
2010
年
科研人员总人数（对数尺度）
中国
美国
日本
德国
韩国
英国
法国
加拿大
西班牙
奥地利

[illegible]2-5 [illegible]

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2-6


从数据
对实际结果建立模型
不同的天气需要多少不同的防冻剂?
从模型
解释性能
防冻剂的原理是什么?
从原理
划分类型和等级
防冻剂有什么种类?
从概括
总结普遍规律
如何理解其他种类的防冻剂?
产业
高校

2-6

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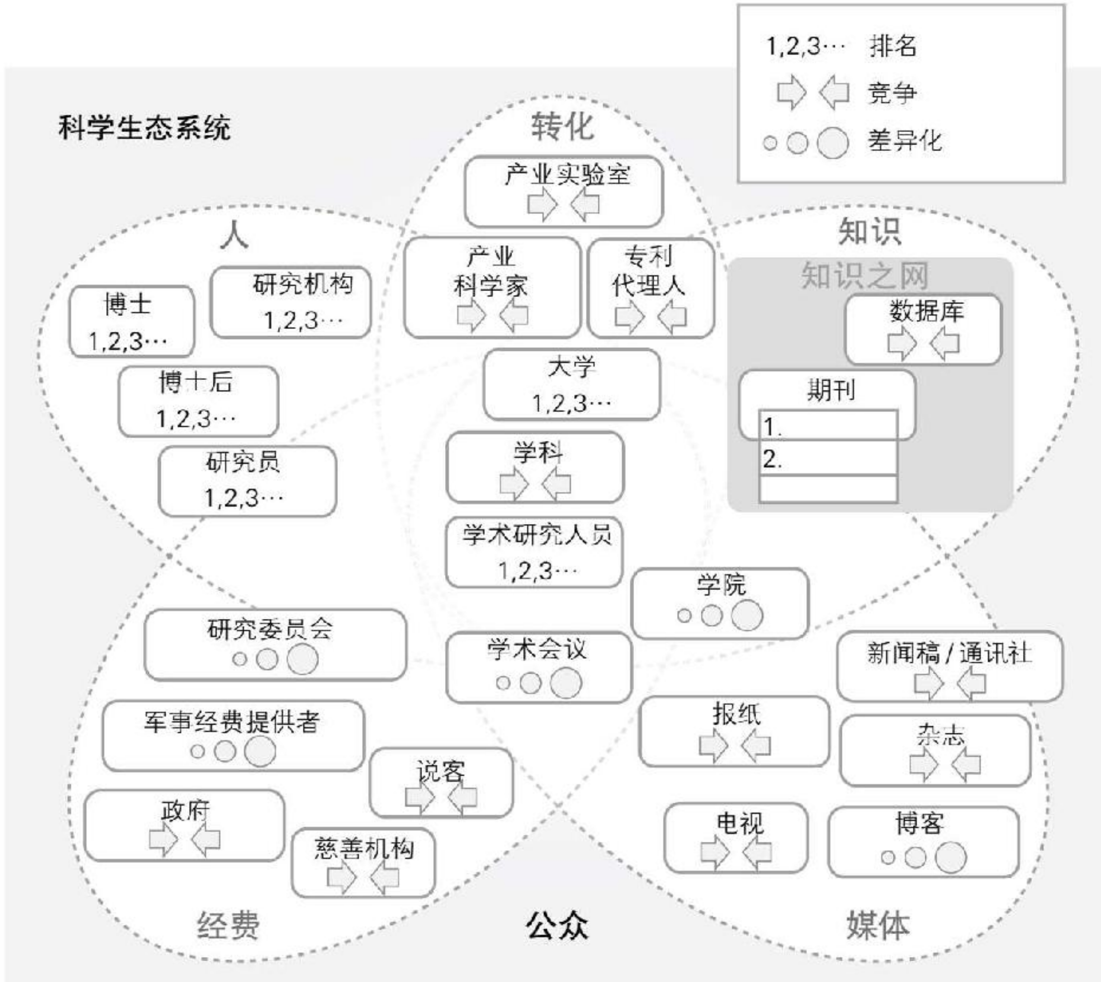
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科学生态系统
转化
产业实验室
人
知识
产业
科学家
专利
代理人
知识之网
博士
1,2,3…
研究机构
1,2,3…
数据库
博士后
1,2,3…
大学
1,2,3…
期刊
1.
2.
研究员
1,2,3…
学科
学术研究人员
1,2,3…
学院
研究委员会
学术会议
新闻稿 / 通讯社
军事经费提供者
报纸
杂志
说客
政府
慈善机构
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自然 | 科学
生态系统

自然	科学
太阳	英镑、美元、欧元
降雨	人
土壤	自由
养分	基础设施
固碳	知识的巩固
腐殖循环	改变的循环
基因	模因
适应性	品牌
气候	政治
天气	科学趋势或流行话题
栖息地	机构
生物多样性	多样性
生态系统产品	科技、科学知识、培训
生态系统服务	美、理解、启发
生态恢复力	惯性、同行评议
生态抵抗力	体制化

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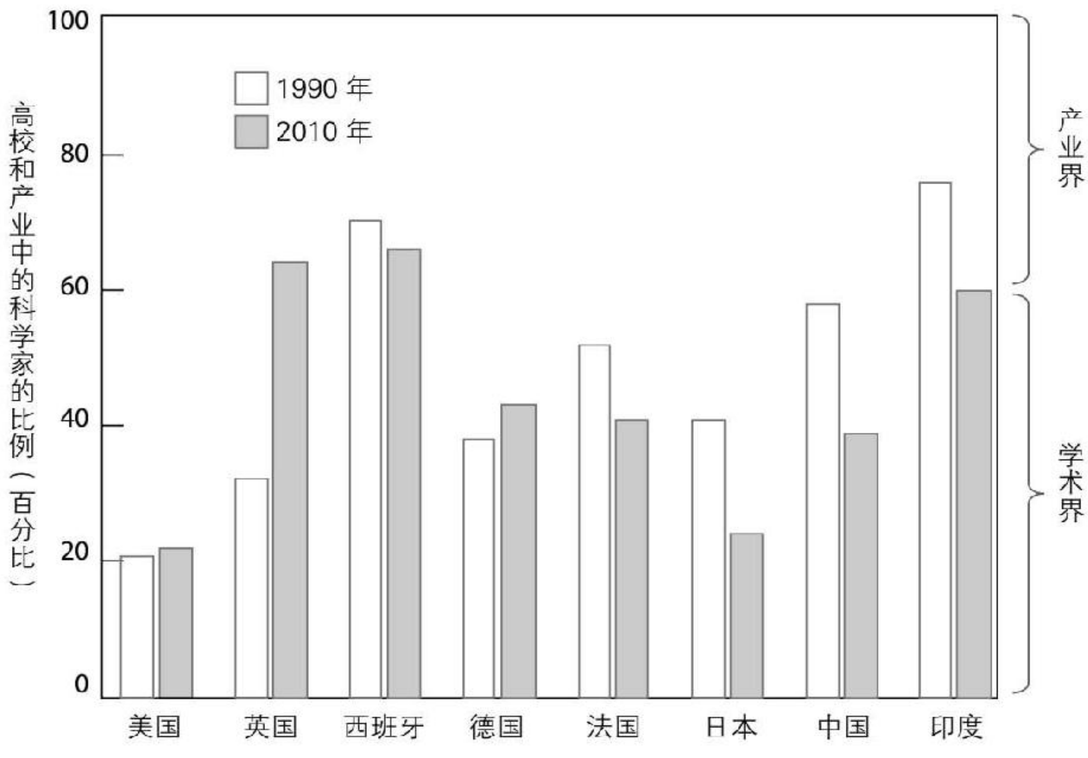
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[illegible]60[illegible]

[illegible]15[illegible]25[illegible]20[illegible]20[illegible]90[illegible]“[illegible]”[illegible]“[illegible]”[illegible]

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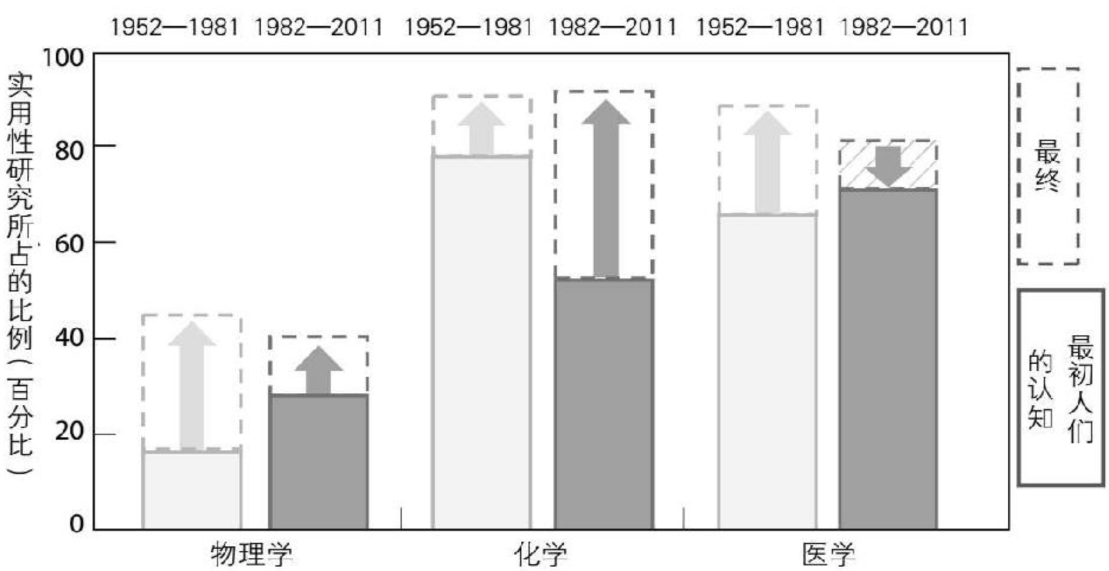
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1952—1981
1982—2011
1952—1981
1982—2011
1952—1981
1982—2011
100
80
60
40
20
0
实用性研究所占的比例（百分比）
物理学
化学
医学
最终
最初人们的认知

[illegible]3-4 [illegible]1952-1981[illegible]1982-2011[illegible]

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[illegible]“[illegible]”[illegible]

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图 4–1（a）



图 4–1（b）

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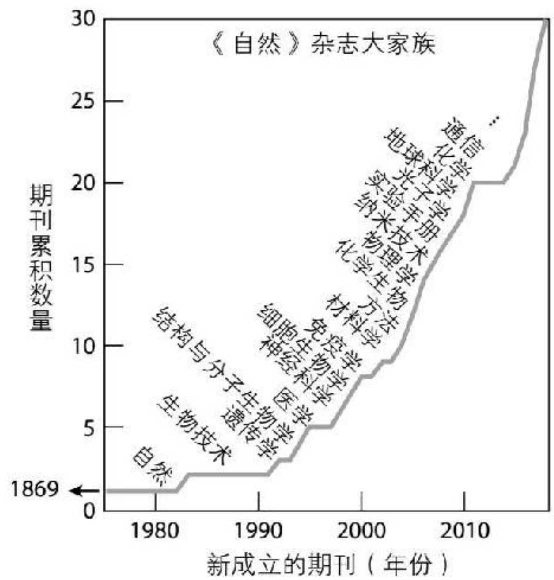
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“” *Nature* · *Nature Physics* · *Nature Materials* · *Nature Nanotechnology* 4-2 *Advanced Materials* *Advanced Functional Materials* *PLOS ONE* PLOS “” “”



图 4–2（a）



《自然》杂志大家族
期刊累积数量
新成立的期刊（年份）
30
25
20
15
10
5
0
1869
1980
1990
2000
2010
自然
生物技术
结构与分子生物学
遗传学
医学
神经科学
细胞生物学
免疫学
材料科学
方法
化学生物
物理学
纳米技术
实验手册
光子学
地球科学
化学
通信
…

图 4–2（b）

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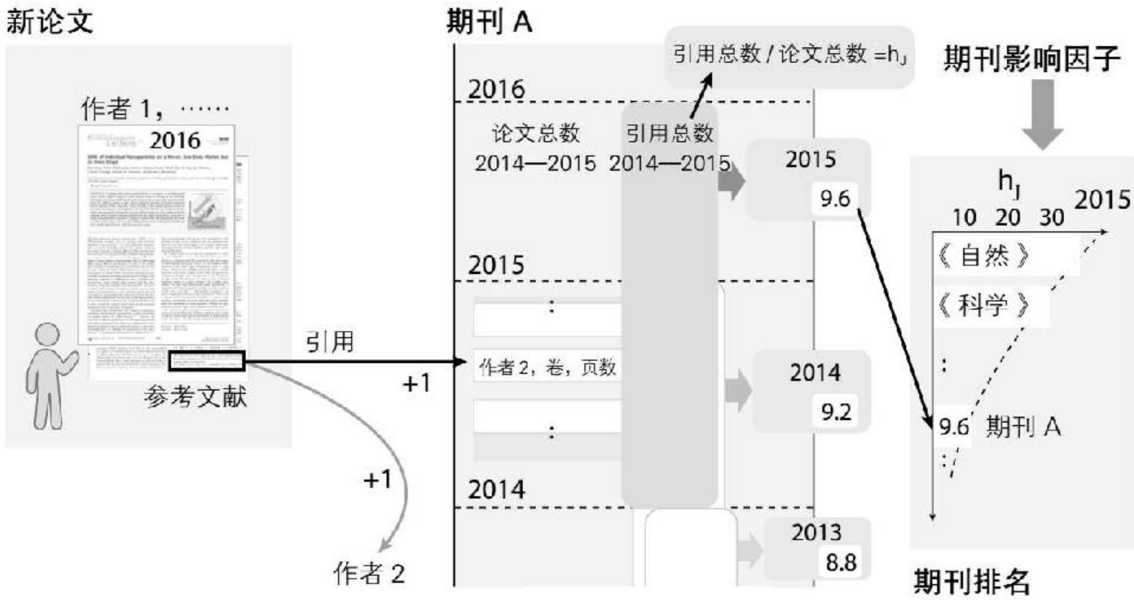


图 4–3（a） 图 4–3（b） 图 4–3（c）

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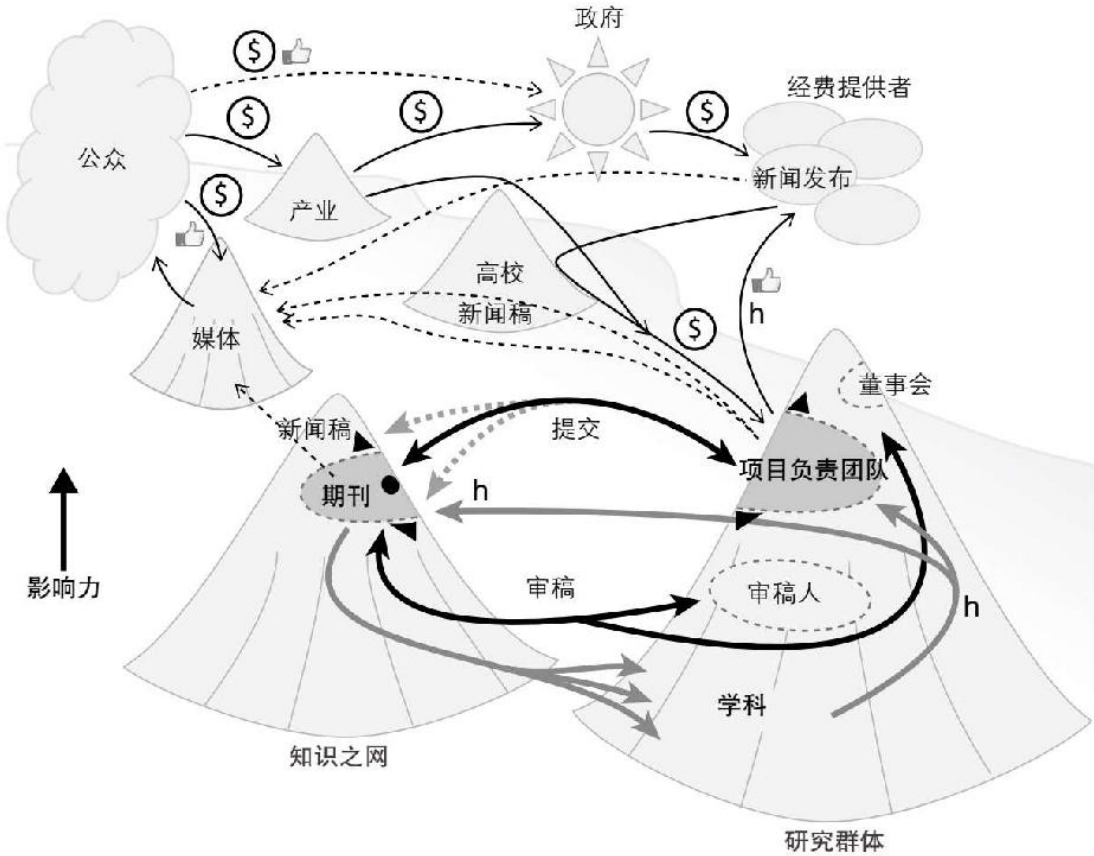
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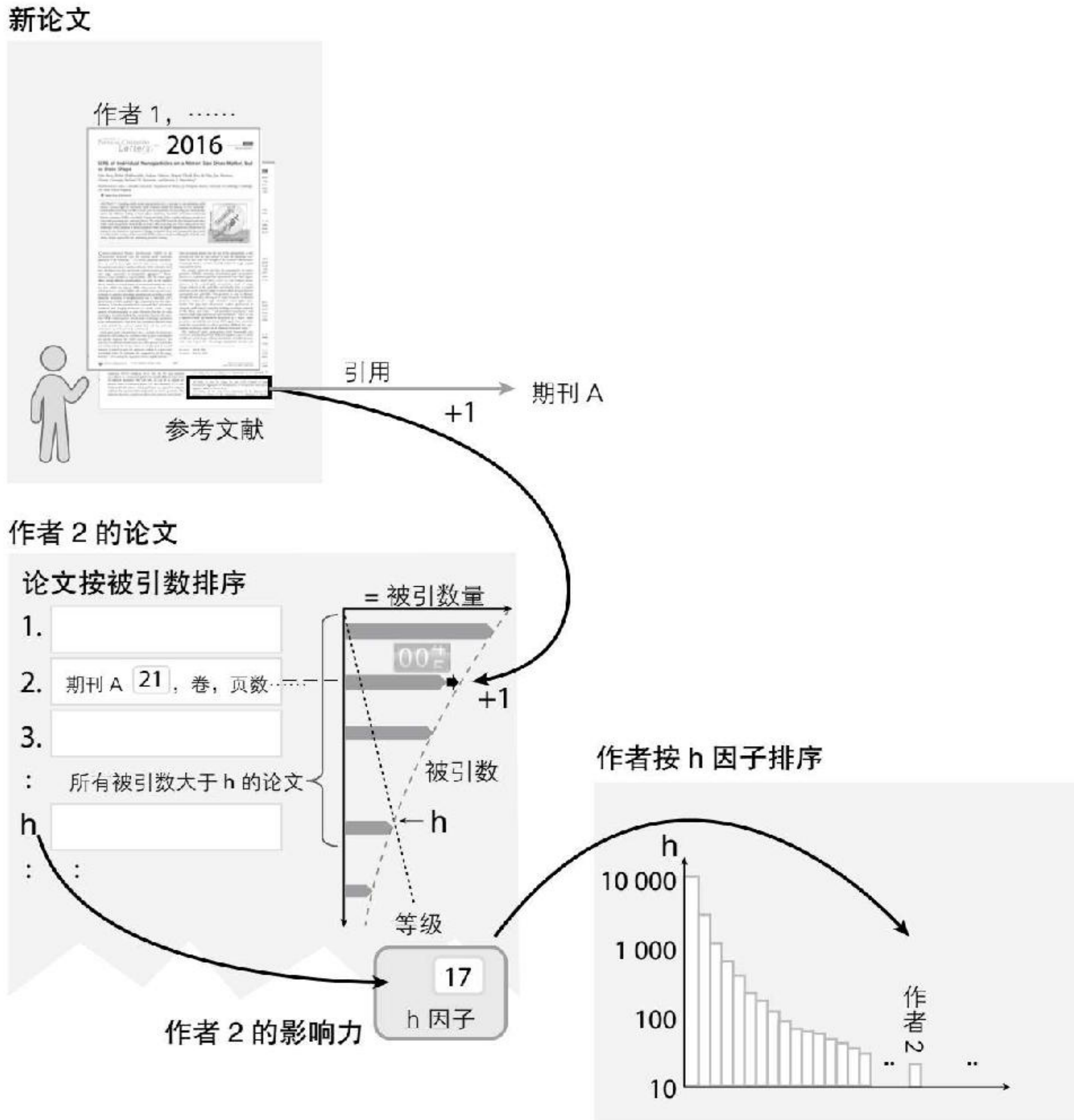


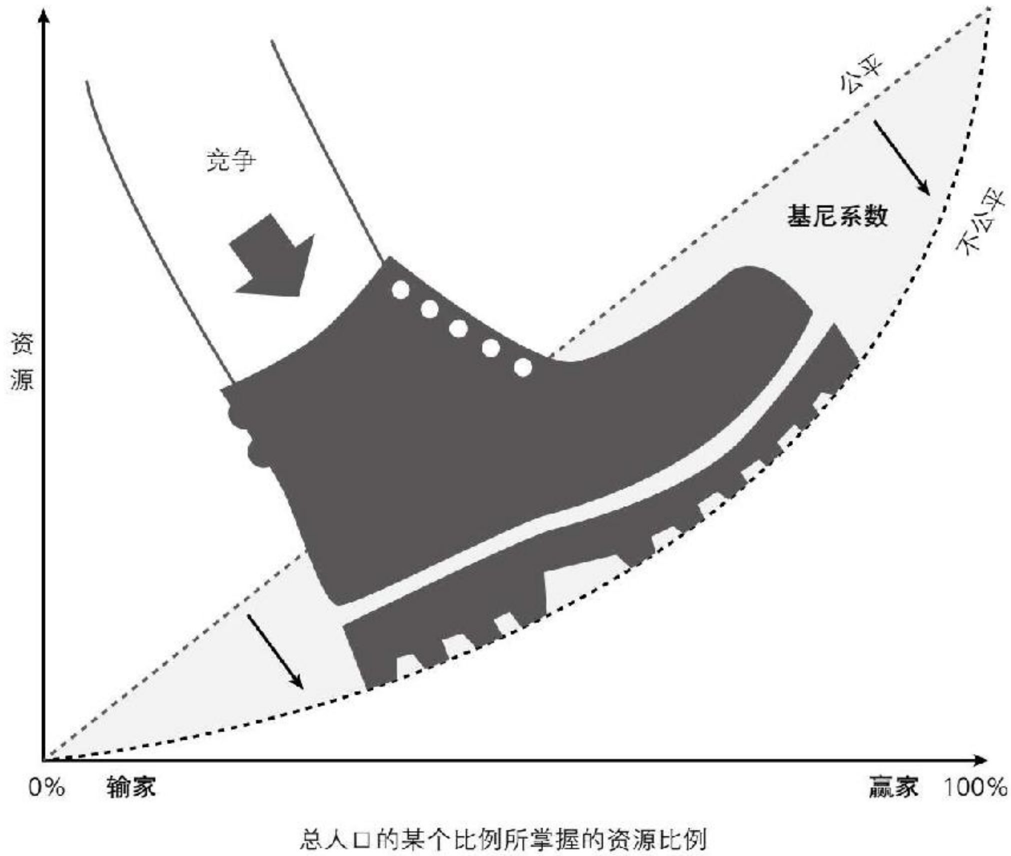
图 4–5（a）　　图 4–5（b）

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4-6

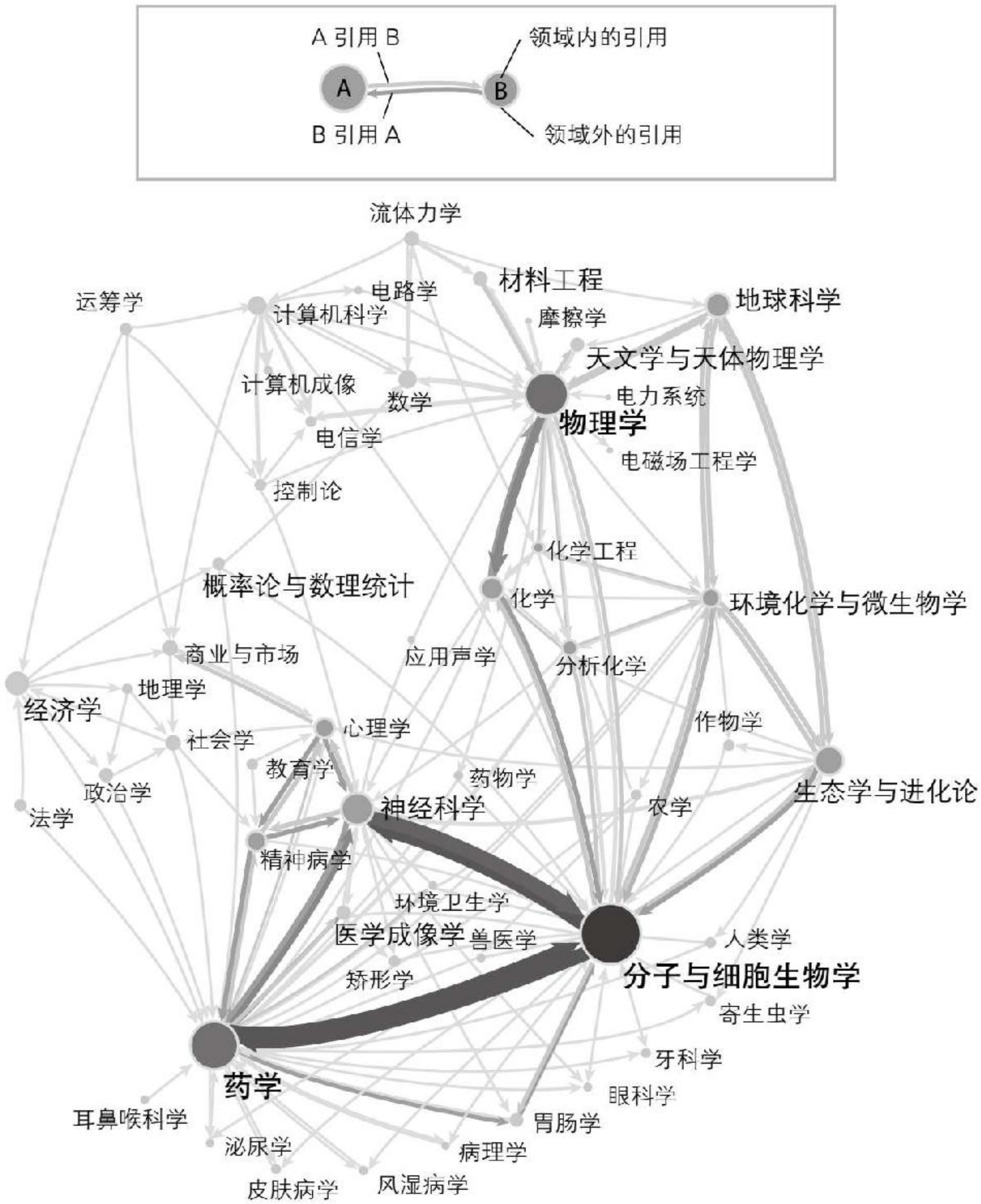
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A 引用 B
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领域外的引用
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电路学
运筹学
计算机科学
地球科学
摩擦学
天文学与天体物理学
计算机成像
数学
电力系统
物理学
电信学
电磁场工程学
控制论
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环境化学与微生物学
商业与市场
应用声学
分析化学
经济学
地理学
作物学
心理学
社会学
教育学
药物学
政治学
生态学与进化论
神经科学
农学
法学
精神病学
环境卫生学
人类学
医学成像学
兽医学
分子与细胞生物学
矫形学
寄生虫学
牙科学
药学
眼科学
耳鼻喉科学
胃肠学
泌尿学
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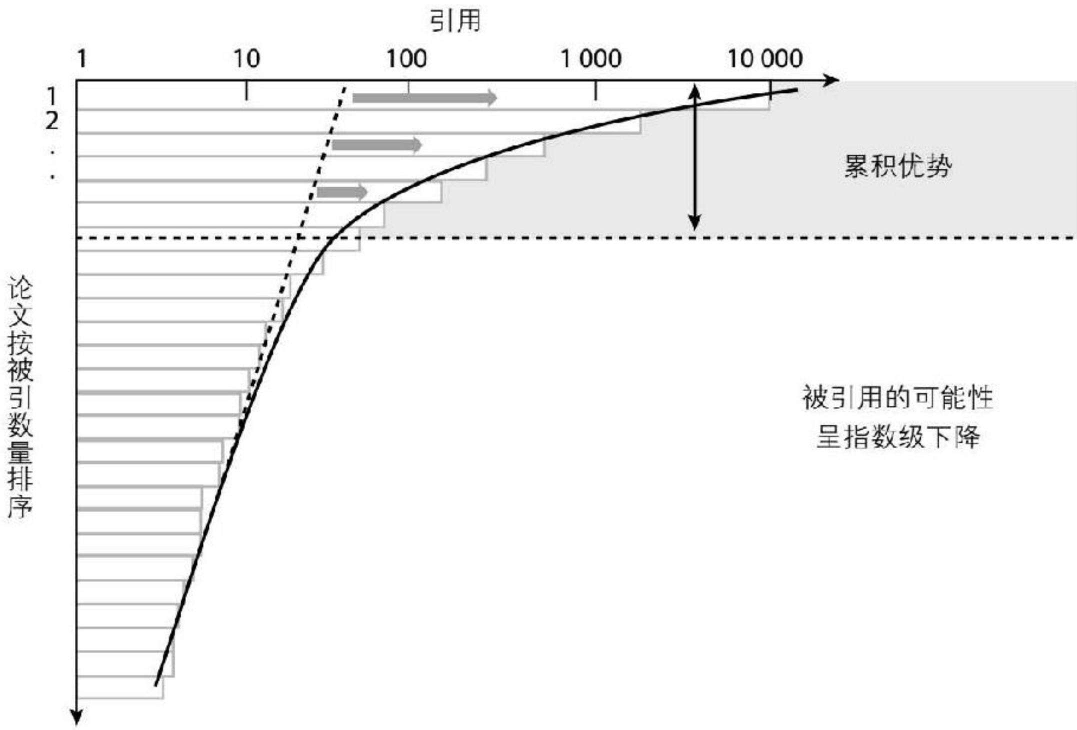
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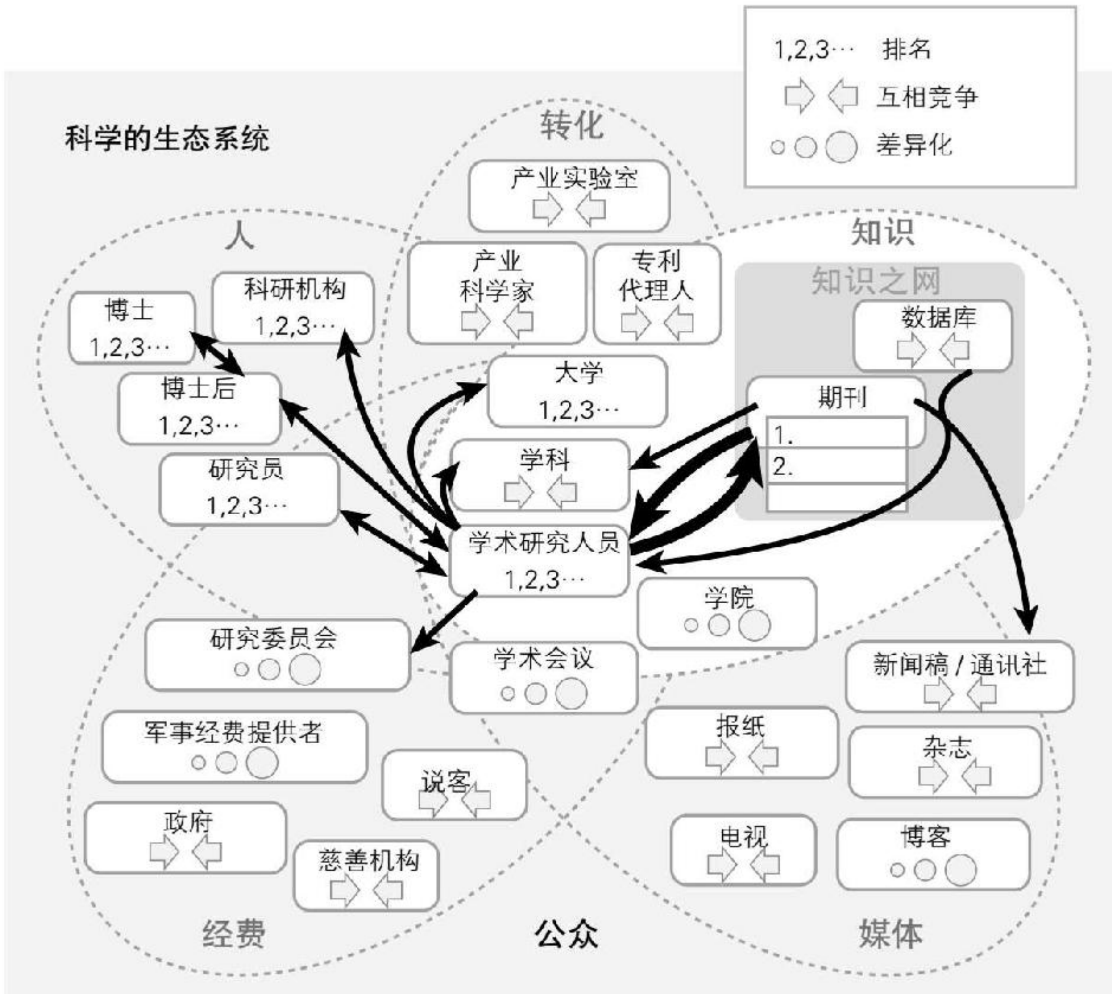
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1,2,3··· 排名
互相竞争
差异化
科学的生态系统
转化
产业实验室
人
知识
产业科学家
专利代理人
知识之网
科研机构 1,2,3···
博士 1,2,3···
数据库
大学 1,2,3···
博士后 1,2,3···
期刊
1.
2.
学科
研究员 1,2,3···
学术研究人员 1,2,3···
学院
研究委员会
学术会议
新闻稿 / 通讯社
报纸
杂志
军事经费提供者
说客
政府
电视
博客
慈善机构
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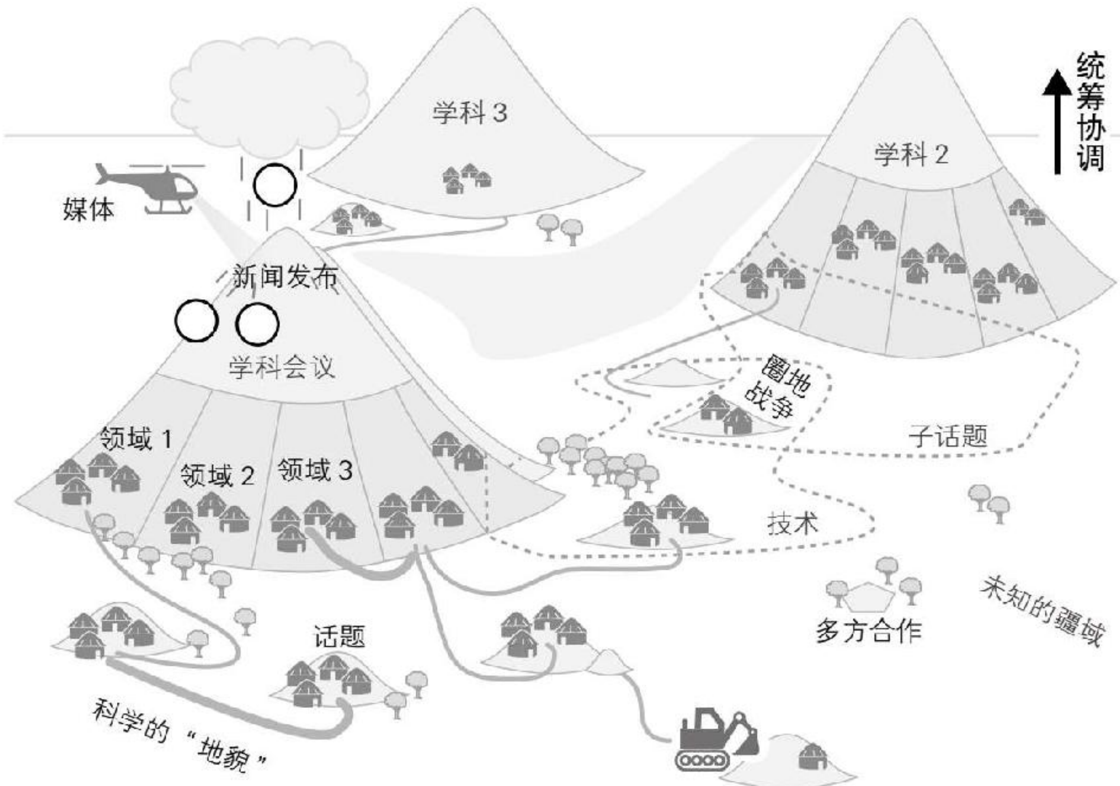
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学科 3
学科 2
统筹协调
媒体
新闻发布
学科会议
圈地战争
子话题
领域 1
领域 2
领域 3
技术
多方合作
未知的疆域
话题
科学的“地貌”

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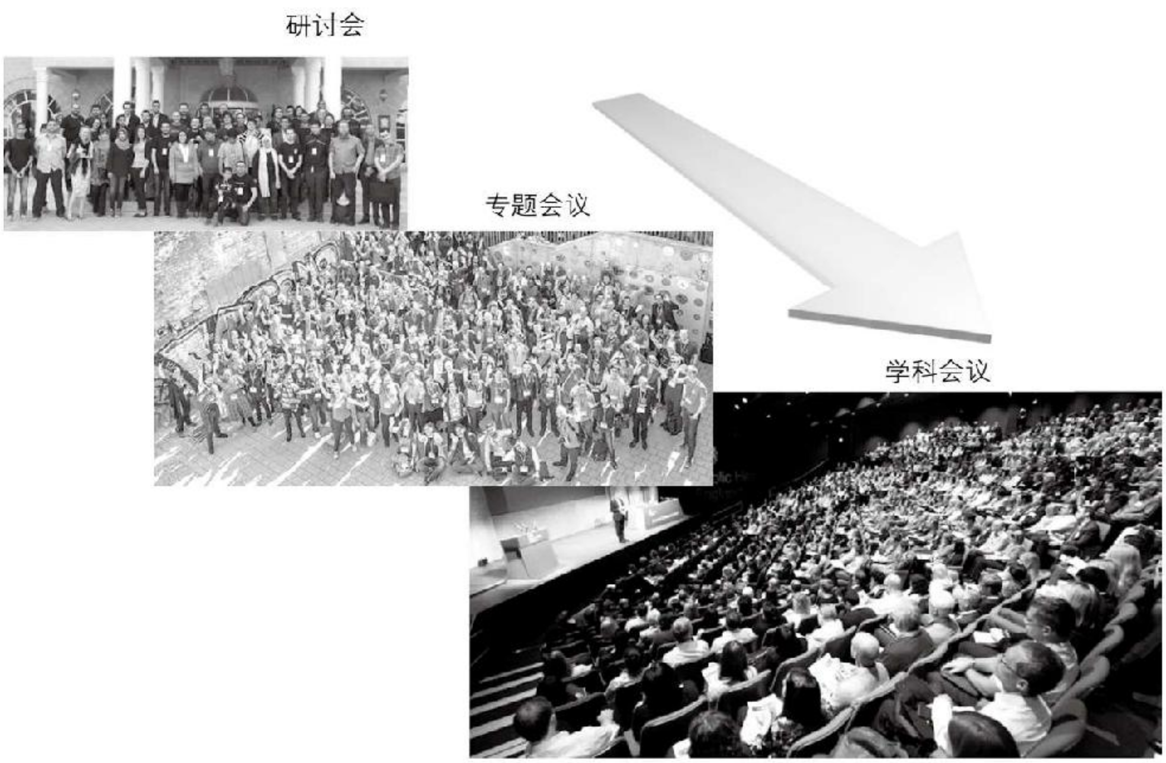
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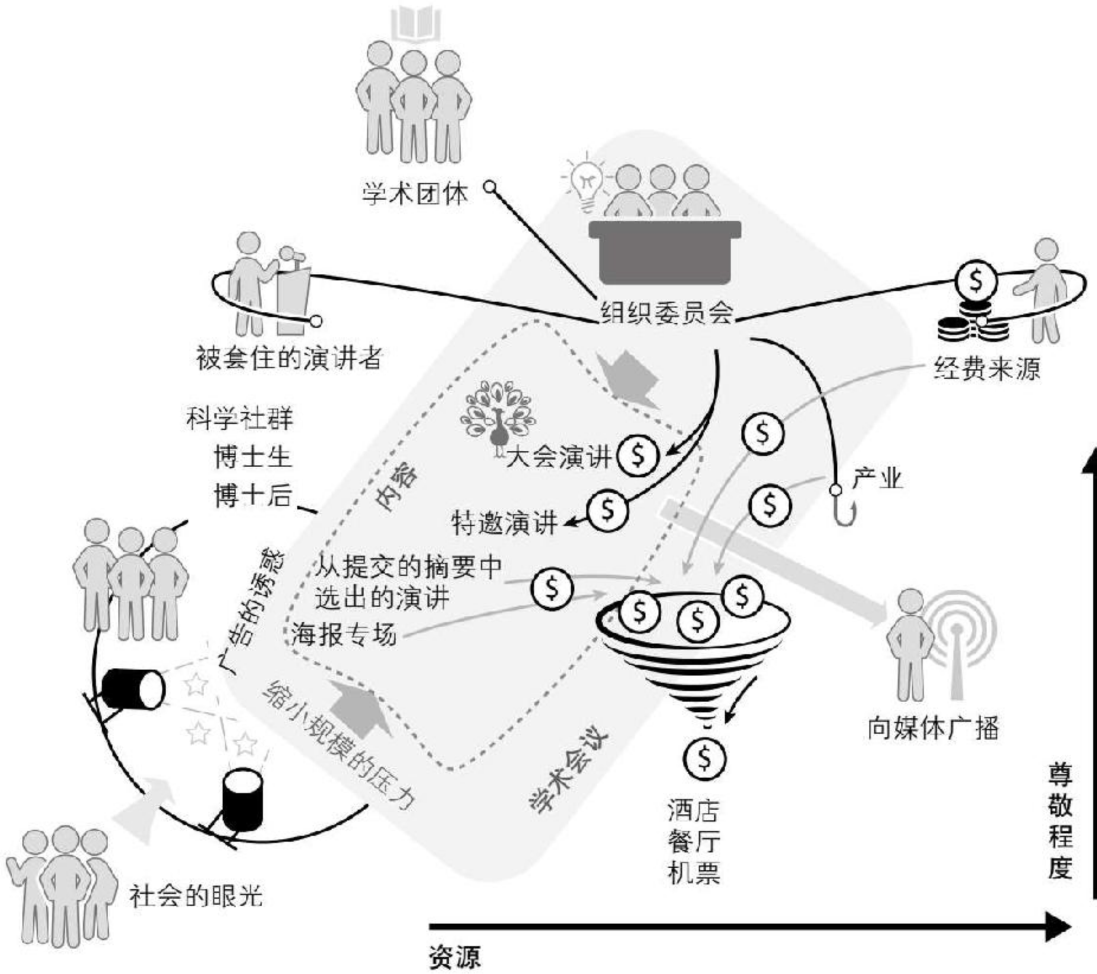
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学术团体
被套住的演讲者
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特邀演讲
产业
广告的诱惑
从提交的摘要中
选出的演讲
海报专场
缩小规模的压力
学术会议
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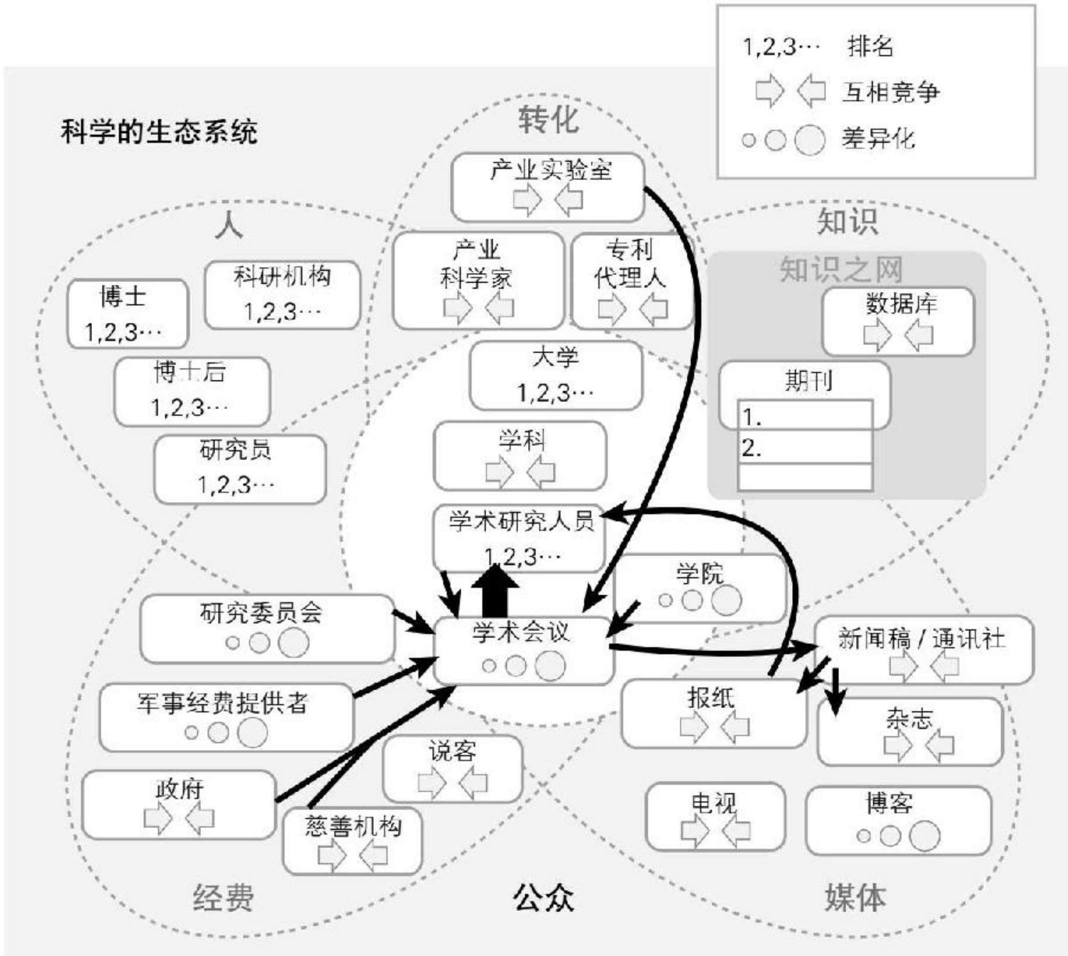
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互相竞争
差异化
科学的生态系统
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知识之网
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科学家
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学术会议
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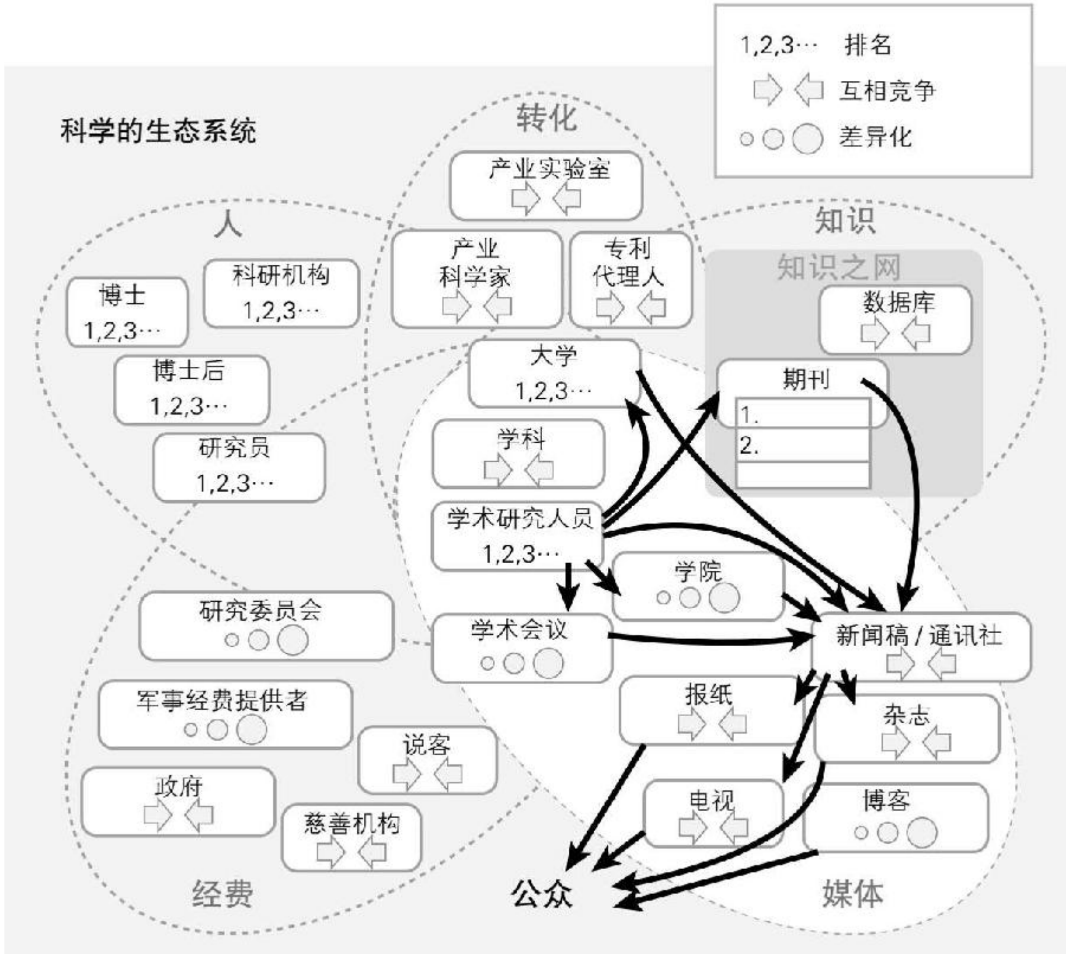
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科学家
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代理人
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学术会议
新闻稿 / 通讯社
军事经费提供者
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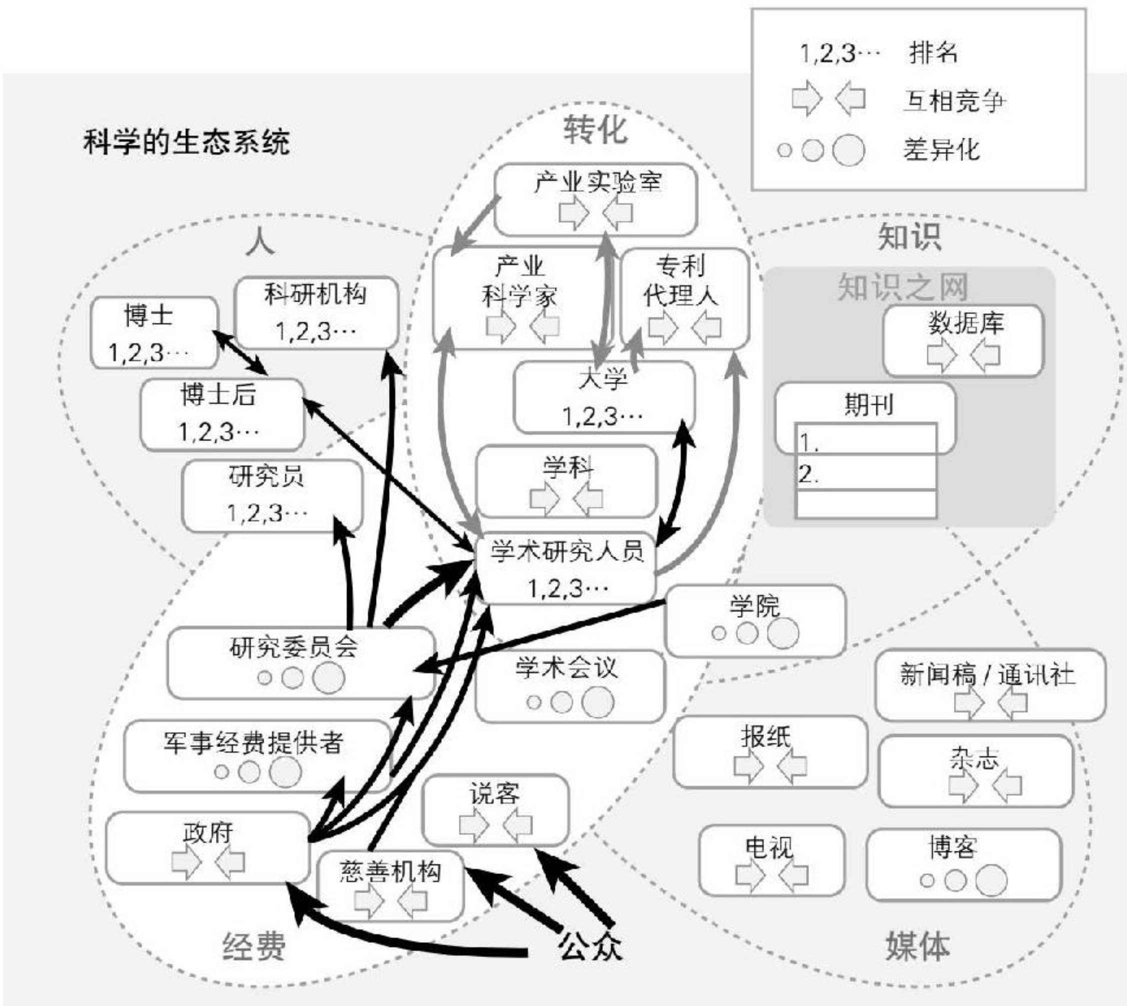
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科学的生态系统
转化
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人
知识
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科学家
专利
代理人
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图 7–2（a） 图 7–2（b） 图 7–2（c）

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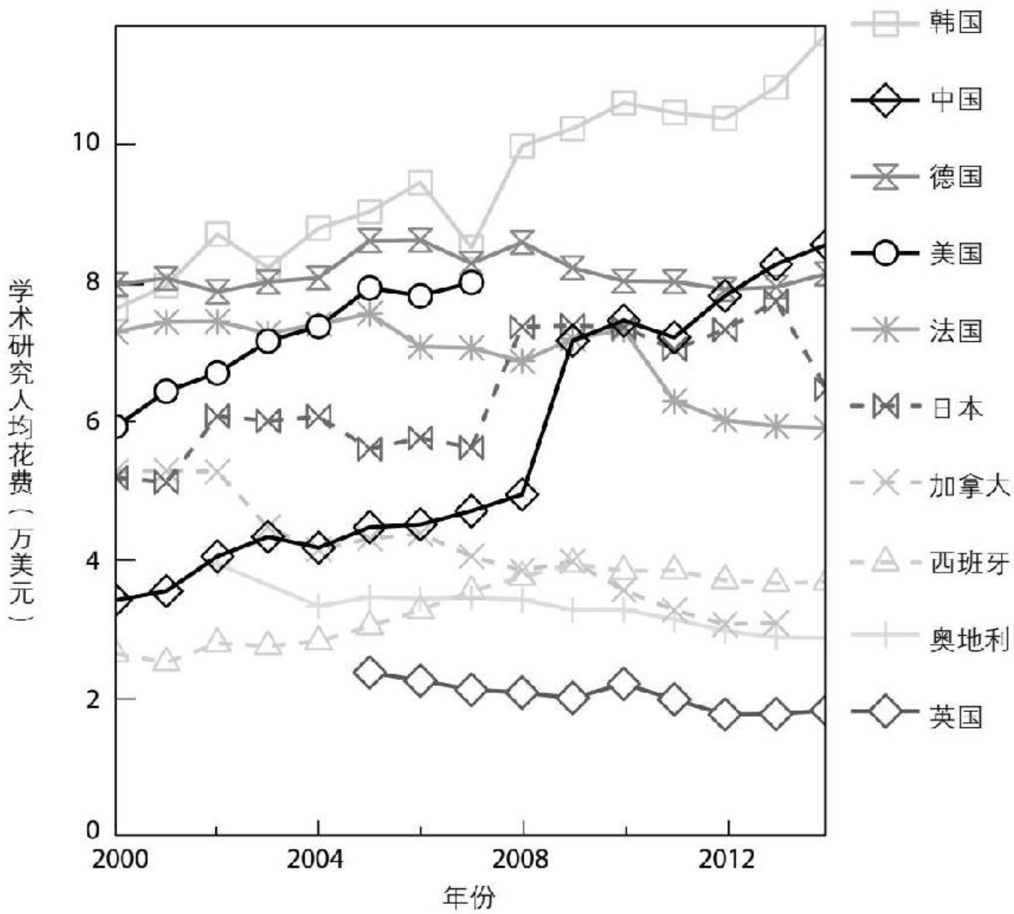
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图 7–4（a）



图 7–4（b）

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图 7–5（a）



图 7–5（b）

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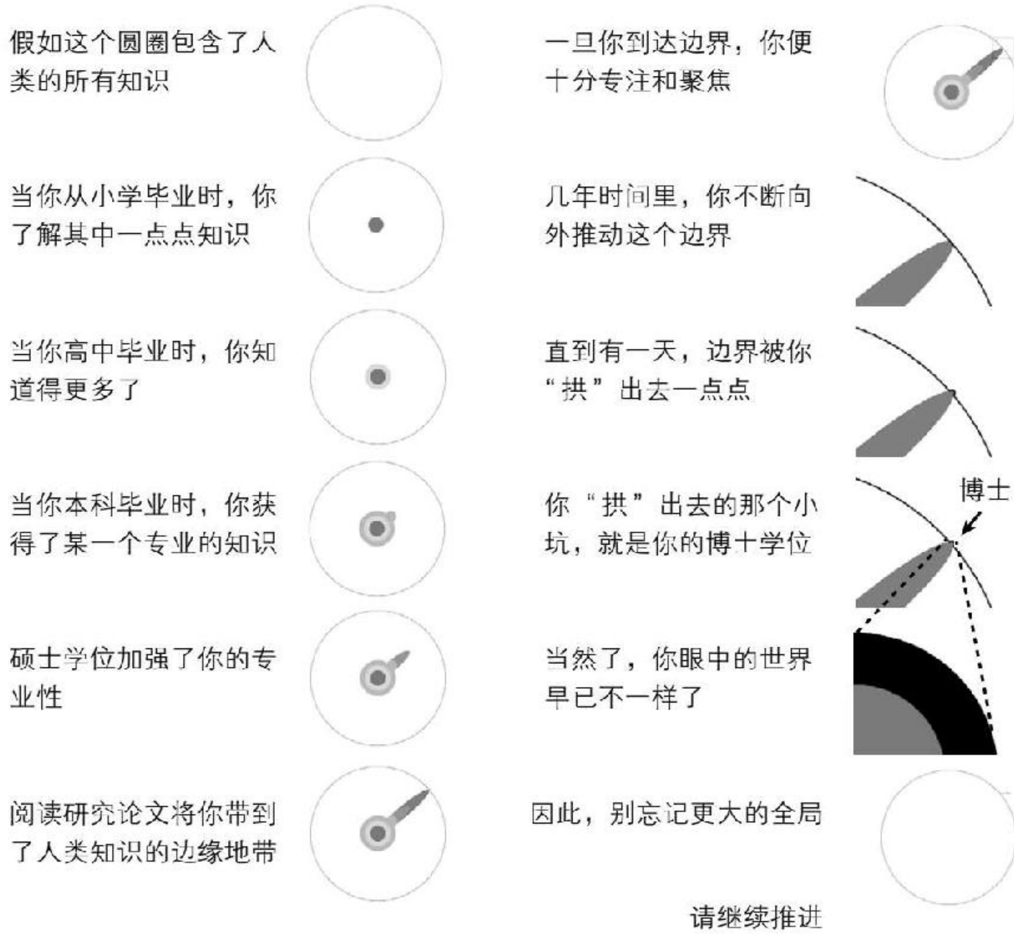
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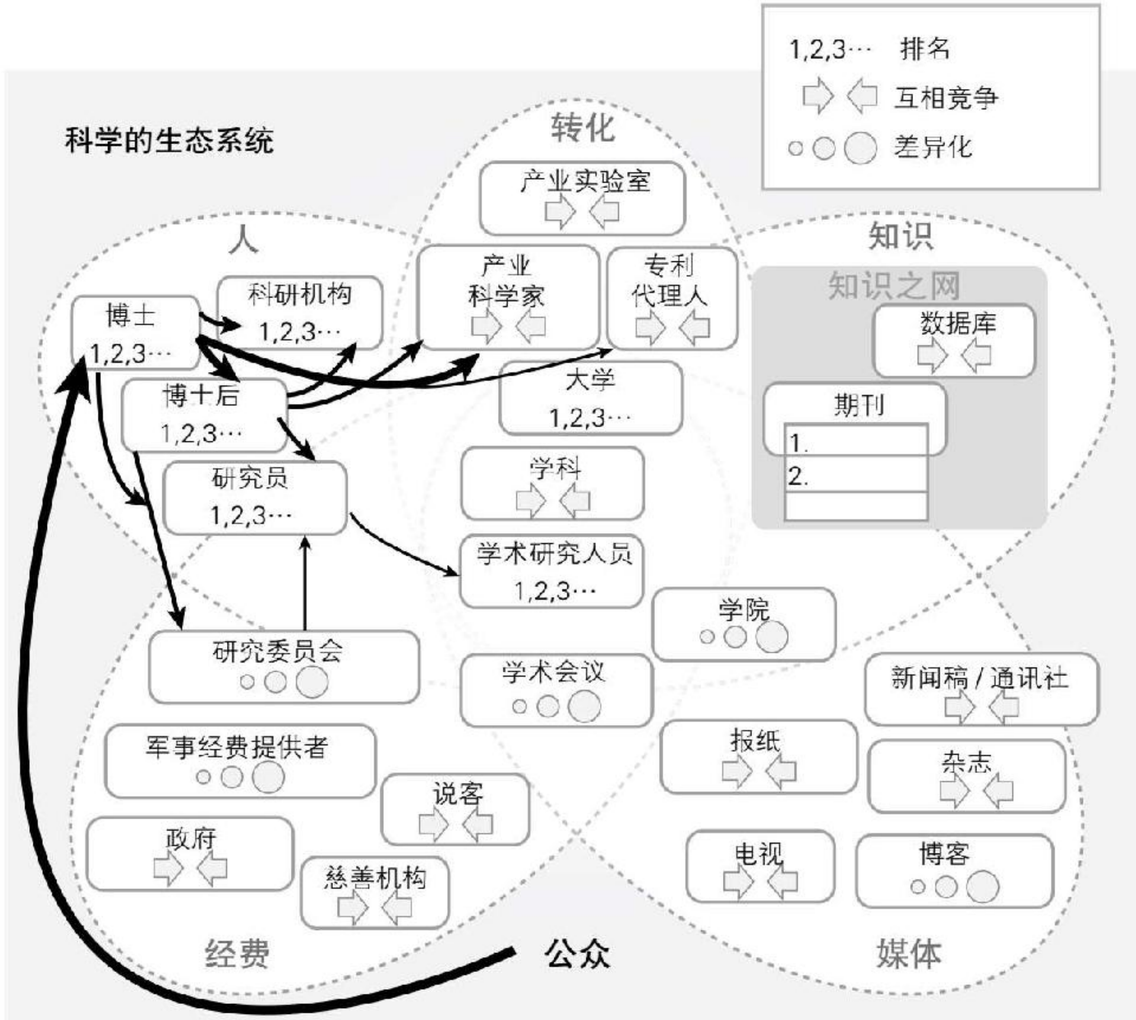
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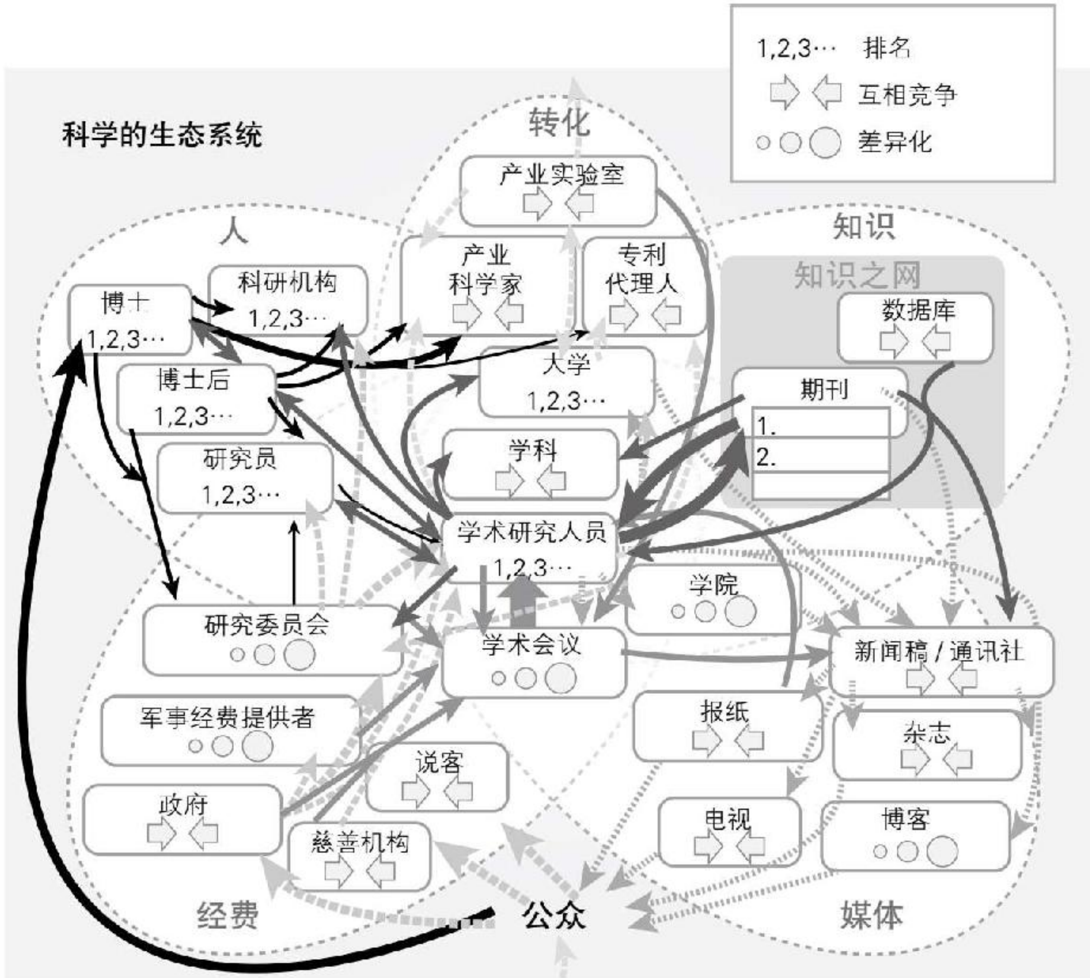
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差异化
科学的生态系统
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产业实验室
人
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图 9–2（a）



图 9–2（b）

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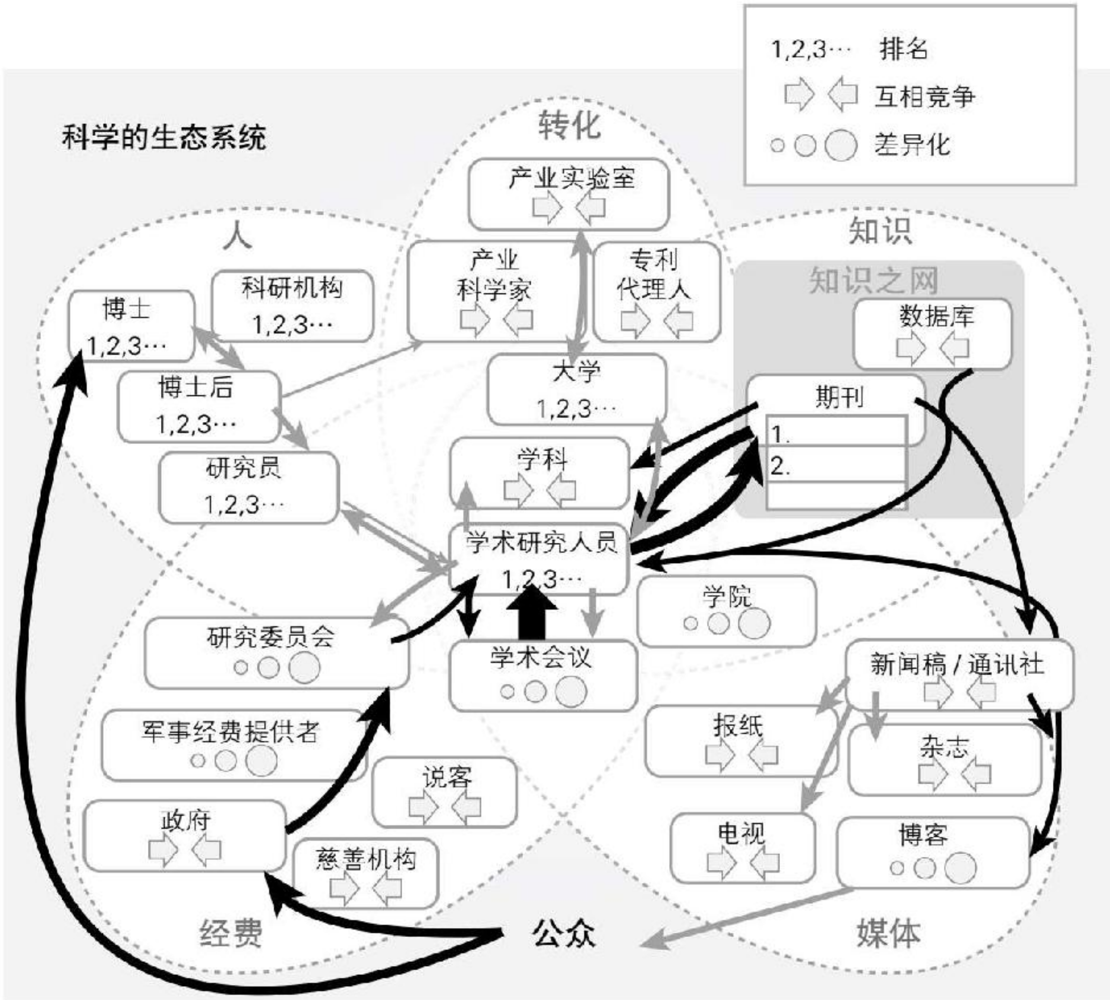
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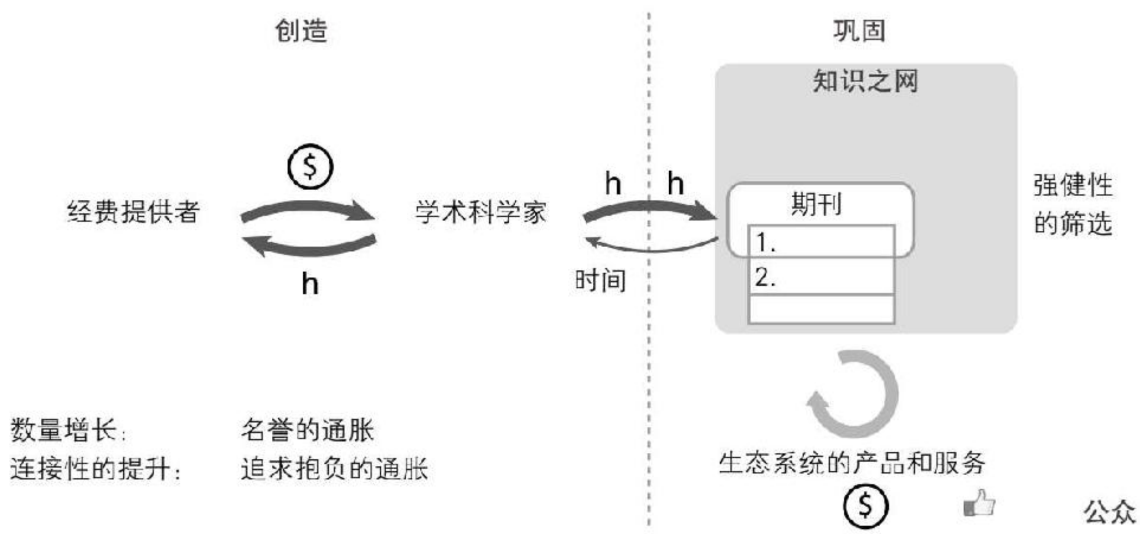
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生态系统的产品和服务
公众

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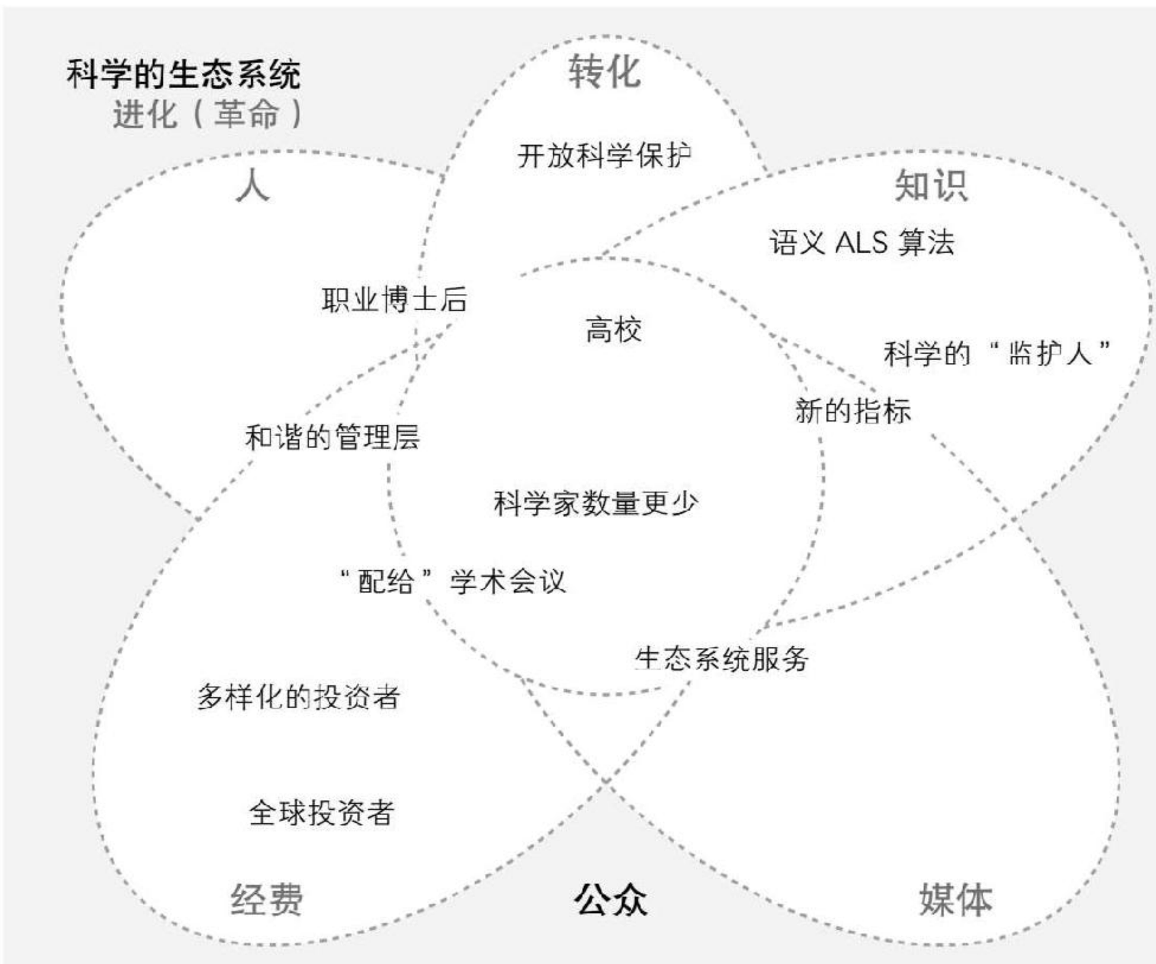
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科学的生态系统
进化（革命）
转化
开放科学保护
人
知识
语义 ALS 算法
职业博士后
高校
科学的“监护人”
新的指标
和谐的管理层
科学家数量更少
“配给”学术会议
生态系统服务
多样化的投资者
全球投资者
经费
公众
媒体

图10-1 □□□□□□□□□□□□□□

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